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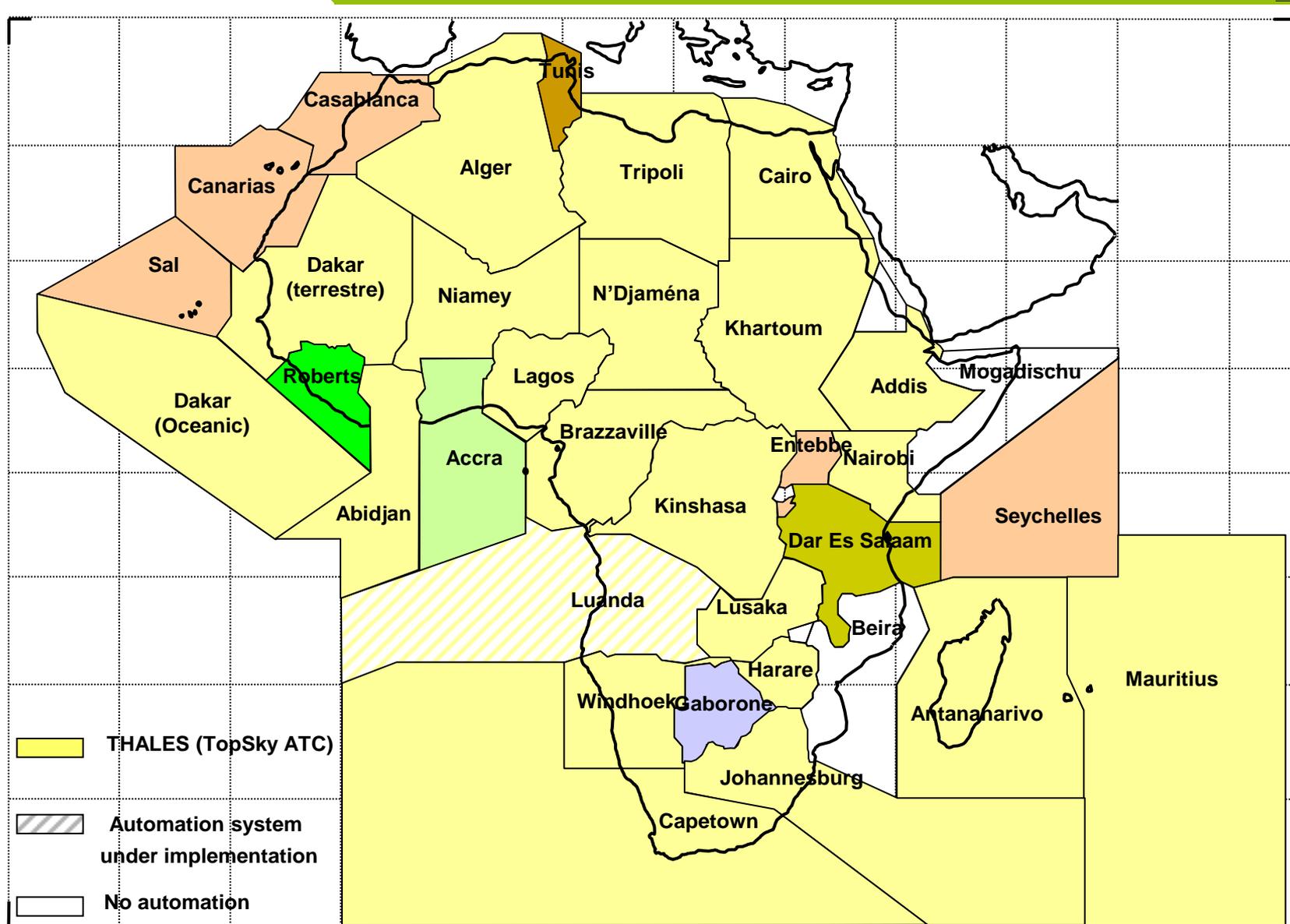
ASECNA ADS-B workshop

Dakar- 22-23th July 2014

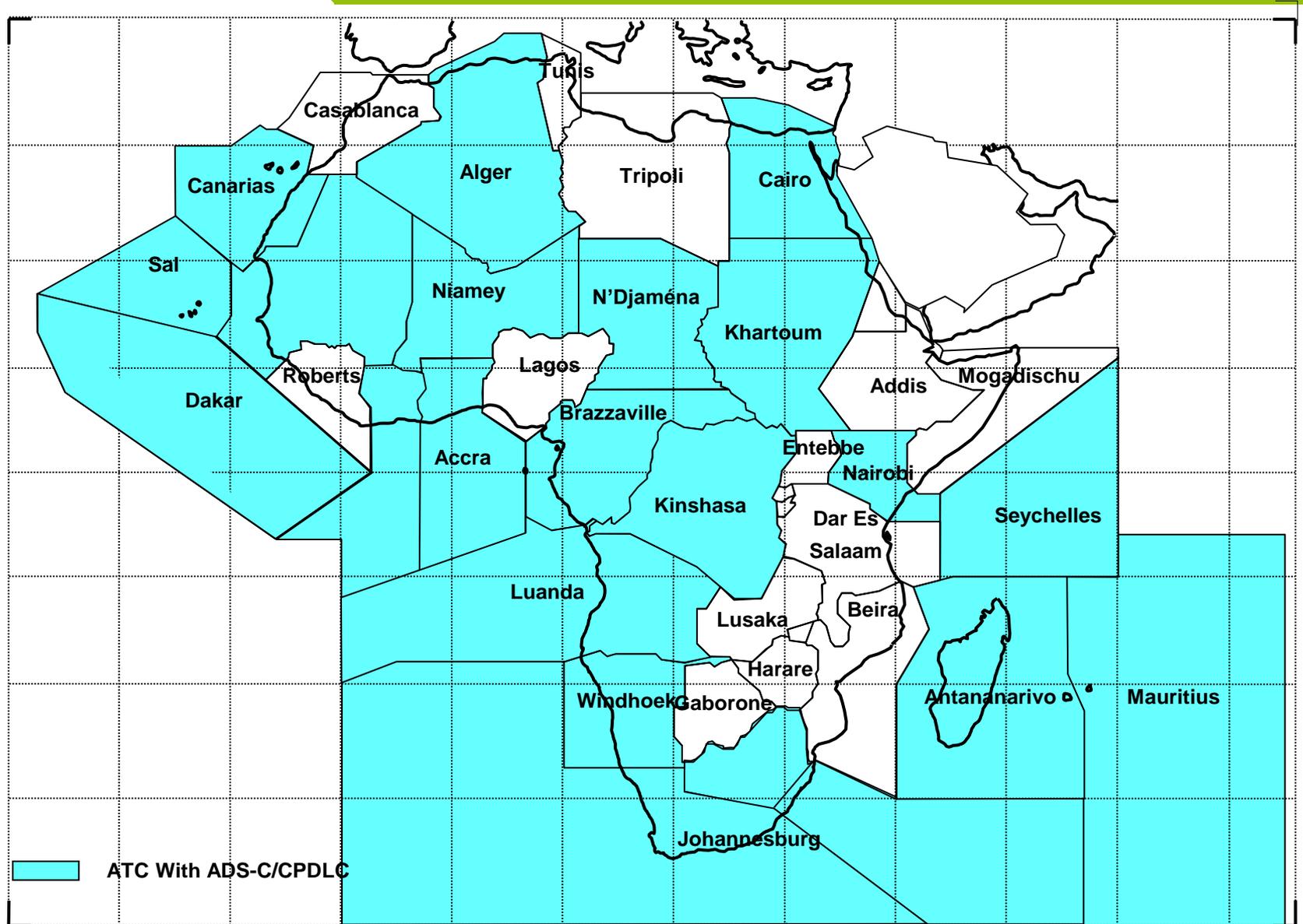
Surveillance in AFI region & ADS-B implementation

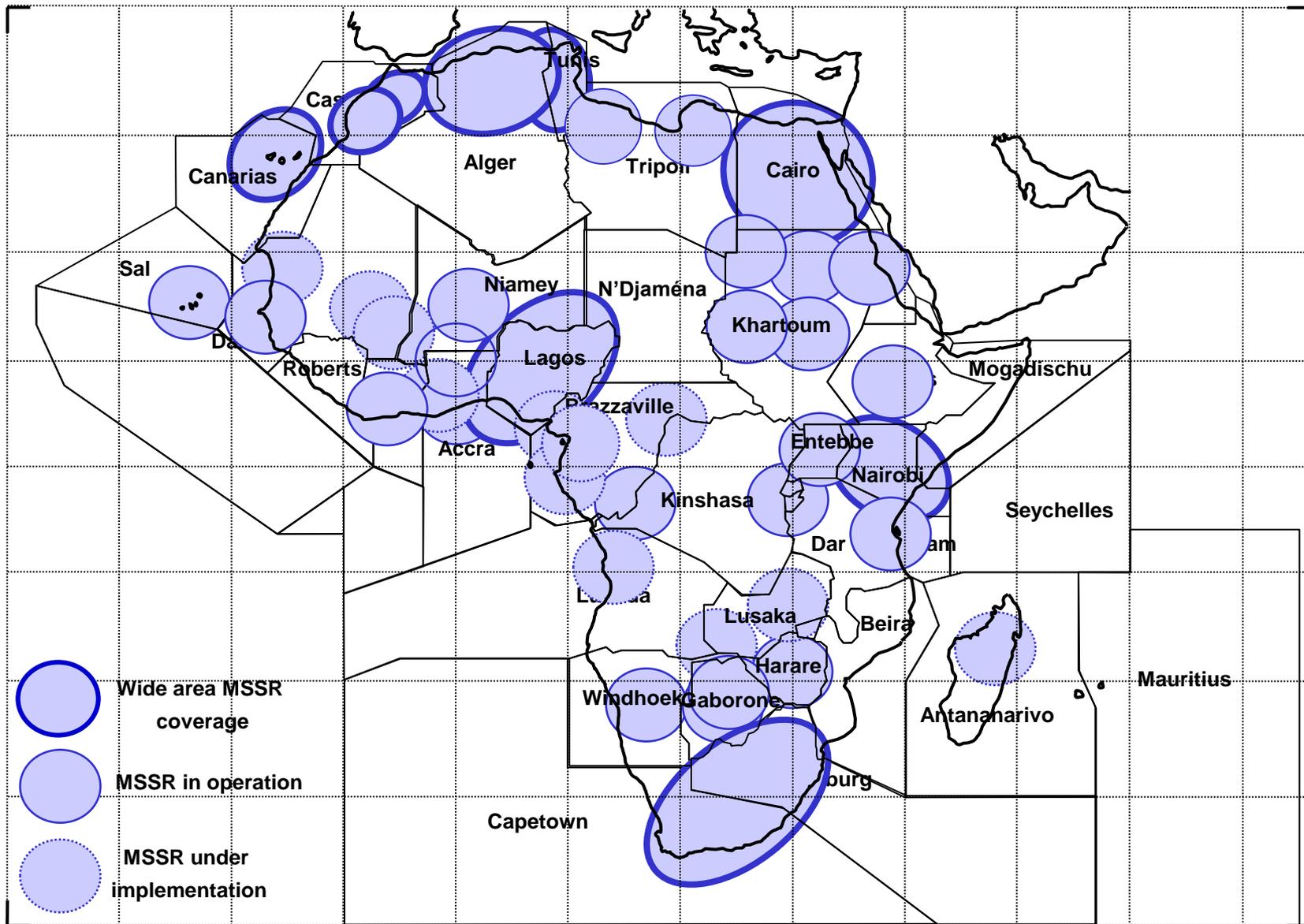
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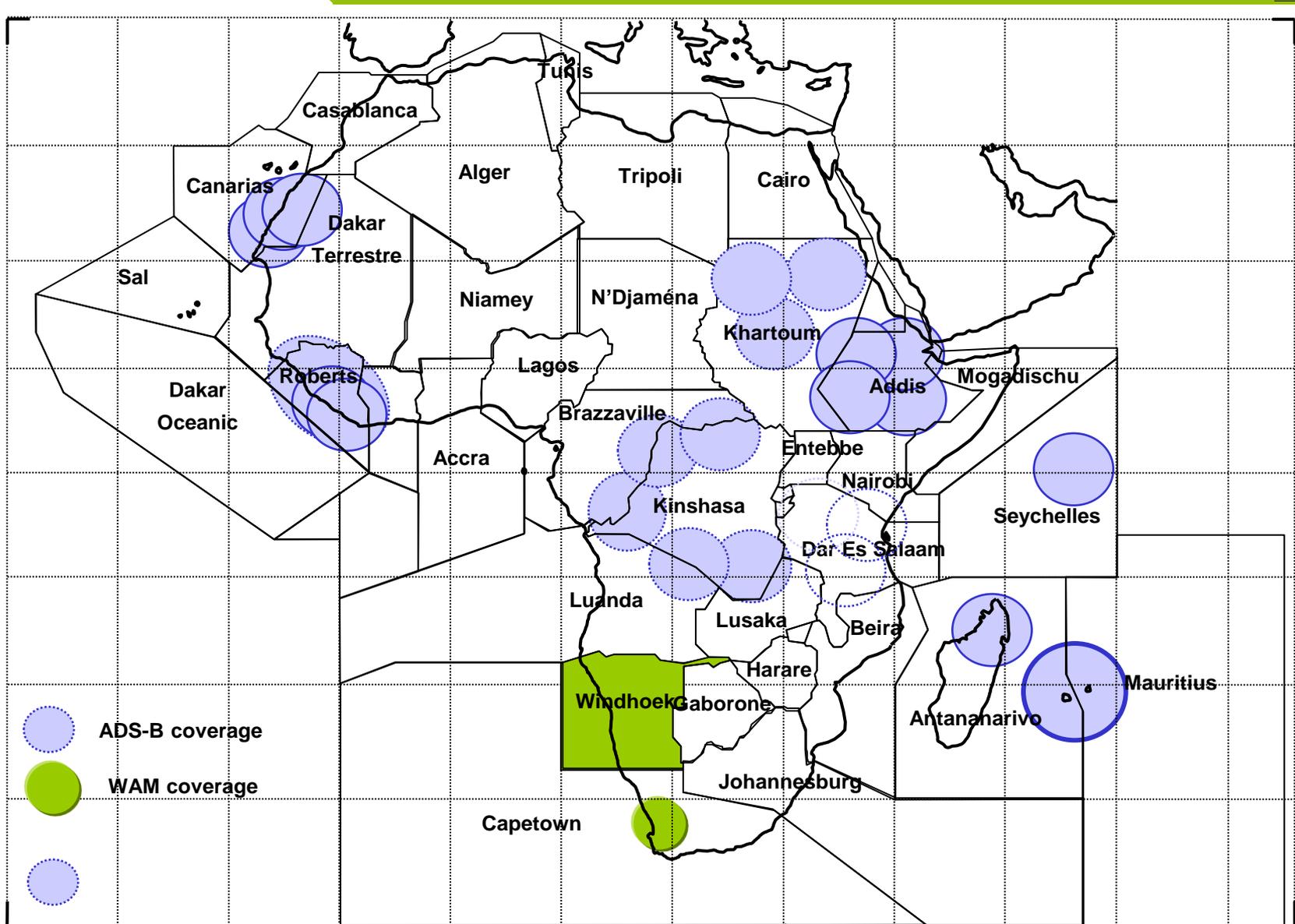
Surveillance Status in AFI Region



AFI Automation Systems with ADS-C/CPDLC (FANS1/A) capabilities (2013)







ICAO AFI Surveillance Strategy

RNP/RNAV Specs.	Spacing	NAV	COM	SUR
RNP10 (RNAV10)	93 km (50 NM).	All aircraft need RNP type 10 approval appropriate for the routes/tracks to be flown.	Voice communications through a third party DCPC may be desirable in certain areas, such as areas of known convective weather.	Procedural-pilot position reports.
RNP5	30.6 km (16.5 NM) in a unidirectional system 33.3 km (18 NM) in a bi-directional system.	All aircraft need RNP type 5 approval appropriate for the routes/tracks to be flown, and NAVAID infrastructure must be provided sufficient to support RNP5 operations.	Direct VHF controller/pilot voice communications.	Procedural-pilot position reports.
RNAV5	Route spacing between RNAV5 routes or between RNAV5 routes and conventional routes should refer to applicable ICAO material.	Based upon the use of RNAV equipment using inputs from one or a combination of the following types of position sensors: a) VOR/DME b) DME/DME c) INS or IRS d) GNSS (ABAS or SBAS) RNAV5 does not require an alert to the pilot in the event of excessive navigation errors. The potential for loss of RNAV capability requires an alternative navigation source.	Direct pilot to ATC (voice) communication is required.	RNAV5 was primarily developed to address requirements for RNAV operation in an ATS Surveillance environment. However, RNAV5 implementation has occurred in areas where there is no Surveillance. This has required an increase in route spacing commensurate with the assurance of meeting the Target Level of Safety. Radar monitoring by the Air Traffic Service may be used to mitigate the risk of gross navigation errors, provided the route lies within the ATS Surveillance and communications service volumes and the ATS resources are sufficient for the task.
RNP4	55.5 km (30 NM).	RNP 4 shall be prescribed for the designated area, tracks or ATS routes GNSS (ABAS or SBAS).	Direct controller-pilot voice communications or controller-pilot data link communications (CPDLC).	An ADS system in which an event contract must be set that includes a lateral deviation event report whenever a deviation from track centre line greater than 9.3 km (5 NM) occurs.

EN ROUTE AIRSPACE OPERATIONS

	Separation (en-trail)	Short term (2008-2015)	Mid- term (2016-2020)	Long term (2020 and beyond)
Type 3	5nm	<u>Dual Coverage</u> SSR where implemented ADS-B where justified WAM where justified	<u>Dual Coverage</u> SSR where implemented ADS-B where justified WAM where justified	<u>Dual Coverage</u> Reduced number of SSRs ADS-B WAM where justified
Type 2	30nm x 30nm	ADS-C SSR where implemented ADS-B where justified WAM where justified	SSR where implemented ADS-B where justified WAM where justified	Reduced number of SSRs ADS-B WAM
Type 1	??? 10 minutes	ADS-C Voice Reporting where justified	ADS-C Voice Reporting where justified	ADS-C Reduced number of Voice Reporting
Remote	??? 10 minutes	ADS-C Voice Reporting where justified	ADS-C Voice Reporting where justified	ADS-C Reduced number of Voice Reporting
Oceanic	30nm x 30nm	ADS-C Voice Reporting	ADS-C Voice Reporting	ADS-C Voice Reporting

Note:

- Type 1: Complex traffic pattern and a high density traffic;
- Type 2: Complex traffic pattern and a medium density traffic; and
- Type 3: Low density traffic.

TERMINAL AIRSPACE OPERATIONS

	Separation (en-trail)	Short term (2008-2015)	Mid- term (2016-2020)	Long term (2020 and beyond)
Type 3	???	SSR where implemented PSR where justified WAM (trials) ADS-B (Trials)	SSR where implemented PSR where justified WAM (gradually) ADS-B (gradually)	WAM (supplemental) ADS-B (primarily)
Type 2	???	SSR where implemented PSR where justified WAM (trials) ADS-B (Trials)	SSR where implemented PSR where justified WAM (gradually) ADS-B (gradually)	WAM (supplemental) ADS-B (primarily)
Type 1	Procedural	Voice Reporting	Voice Reporting	Voice Reporting

Note:

- **Type 1: Complex traffic pattern and a high density traffic;**
- **Type 2: Complex traffic pattern and a medium density traffic; and**
- **Type 3: Low density traffic.**